

Fact Sheet

Science and Safety of Biotech Plant Products



Agricultural biotechnology is a science that allows plant breeders to make precise genetic changes to place beneficial traits – such as pest resistance, disease resistance or herbicide tolerance – into plants.

Since the introduction of biotechnology-derived commercial crop in 1996, farmers have used this science to grow plants that yield more per acre with reduced production costs while being resistant to disease and pests and also beneficial to the environment.

In the near future, we'll see crops that will be resistant to environmental stresses like drought, and crops that use soil nutrients more efficiently, boosting productivity in areas of the world with inadequate rainfall or poor soil. Scientists are also looking to use biotechnology to fortify some food plants with higher nutritional content and to produce pharmaceuticals in plants affordably and efficiently.

Contributing to Sustainable Agriculture

Farmers are enthusiastically embracing this technology, especially corn, cotton and soybean varieties, according to USDA. This growing trend is expected to continue, especially at a time when the United States and the world are looking for science-based solutions to rising food and fuel prices.

Agricultural biotechnology can help farmers feed the world's growing population, while minimizing impacts on the global environment. In 2007, 12 million farmers in 23 countries – 12 developing and 11 industrialized – planted biotech crops, primarily soybeans, corn, cotton and canola. Eleven million of these farmers worked small, resource-poor farms in developing countries.

Biotech crops – most of which are currently disease-resistant, pest-resistant or herbicide tolerant – have helped farmers around the world to increase production, boost farmers' incomes and enable them to farm more sustainably, but the technology promises to provide solutions to other challenges as well.

Benefitting the Environment

Biotechnology is reducing agriculture's environmental footprint by reducing fossil fuel use, soil tillage and run-off from farmer's fields. Studies show that since commercial plantings of biotech crops began in 1996, farmers have saved 551 million gallons of fuel because of reduced field operations. In 2006, 252 million acres of biotech crops reduced carbon dioxide emissions by nearly 15 million metric tons, equivalent to removing nearly 6.56 million cars from the road for an entire year.

Farmers using biotech crops may also use pesticides less frequently because of the pest-resistance traits within the plants themselves. Within the United States alone, biotech crop varieties eliminated the use of 70 million pounds of pesticide applications in 2005.

Future crops designed to tolerate environmental stresses, such as salty or toxic soils, drought, and freezing temperatures, will make agriculture more efficient and sustainable by producing more food, fuel and fiber on less land. Biotech plants being tested also use nitrogen more efficiently, leading to the potential decrease in fertilizer usage. Biotechnology can also be used to produce renewable plant-based energy and industrial products and biological agents to clean up contaminated soils.

A Record of Safety

Biotech crops are among the most heavily regulated agricultural products. The combined expertise of three federal agencies, the U.S. Environmental Protection Agency (EPA), the U.S. Food and Drug Administration (FDA), and the U.S. Department of Agriculture (USDA), is brought to bear on these products. Products derived from this technology are not approved for planting or to enter the food supply until all three agencies have determined that they are as safe as conventional crops.

To ensure that a new plant is safe for the environment, extensive field-testing is conducted under USDA and EPA oversight. To date, there have been no instances of a biotechnology-derived plant approved for field-testing either creating an environmental hazard or exhibiting any unpredictable behavior compared with similar crops modified using traditional methods.

Biotech seed manufacturers want their products to be developed under science-based regulatory scrutiny to ensure safety for humans and the environment. The reality of modern agriculture dictates that this scrutiny makes not for just good science, but also good business.

Adoption by Farmers

Biotech crops have been adopted by farmers worldwide at higher rates than any other agricultural practice in the history of agriculture. Since the first significant commercial plantings in 1996, acreage devoted to biotech crops has increased 60-fold.

In the United States:

- Eighty percent of all the corn planted are biotech varieties.
- Ninety-two percent of all the soybeans planted are biotech varieties.
- Eight-six percent of all the cotton planted are biotech varieties.
- Fifty percent of all the papaya planted are biotech varieties.

The benefits of biotech crops are demonstrated not only by increases in productivity but also by the rapid adoption of these crops by growers. Farmers recognize that their productivity goes up and costs go down when they grow these crops, providing for more sustainable production for the world's consumers.